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ABSTRACT

This paper is concerned with the research and development work that is being undertaken in applying interaction analysis to the training of university lectures. Interaction analysis or the systematic observation of lecturing is a technique that has been used in conjunction with microteaching to facilitate the trainer's job in shaping the teaching behavior of the lecturer. A category system was devised to describe the content of lectures, focusing on teaching points, examples, instructional asides, and non-instructional asides. The paper reports on how university lecturers are trained in the system and how they learn to record data collected from their lecturers. These low inference data are then used in microteaching sessions where the lecturers record on videotape their performance for peer and trainer criticism. The systematic observation data are used to make more objective the trainer's criticism of the microlectures and to provide evaluative data for improving teaching performance. (Author)

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WORKING PAPER:

The Use of Interaction Analysis in the Training of University Teachers.

Ray McAleese

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IR 005 369

Abstract

This paper is concerned with the research and development work that is being undertaken in applying interaction analysis to the training of university lecturers. Interaction analysis, or more correctly in this context, the systematic observation of lecturing is a technique that has been used in conjunction with microteaching to facilitate the trainer's job in shaping the teaching behaviour of the lecturer. A category system was devised that described the Content of lectures, focusing on Teaching Points (P), Examples (E), Instructional Asides (Ai) and Non-Instructional Asides (Au). To this was added a 'dust-bin' category (X) to make the system inclusive with mutually exclusive events. The paper reports on how university lecturers are trained in the system and how they learn to record data collected from their lectures on Time Line Displays. These low inference data are then used in microteaching sessions where the lecturers record on videotape their performance for peer and trainer criticism. The systematic observation data are used to make more objective the trainer's criticism of the microlectures and to provide evaluative data for improving teaching performance. The category system is also being used to study lecturing and to develop norms of effective and ineffective lecturing. Using 'norms' established in a correlational study it is hoped to construct profiles of lecturing that can be further used in training to demonstrate effective teaching.

The Use of Interaction Analysis in the Training of University Teachers.

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Although expansion in the tertiary sector of education has slowed up, each year some 700 new teaching staff are appointed in British universities. By 1980 it is estimated that we may well have 35,000 lecturers in our universities. At present the salary bill for lecturers is approximately £140 million (at 1972 prices). A figure, that in relation to the national wage bill or the total cost of the tertiary sector, is not insignificant. Only recently, has the problem of how new members of staff should be trained come in for the extensive research and development that has been applied to teachers in other sectors of education. With increasing talk about regional and national training, it is becoming obvious that university lecturers require the most efficient and effective training techniques that are available, in order that they can become effective teachers as soon as possible after appointment. Research work in the university of Aberdeen has been examining some techniques that have been used in both the U.S.A. and this country with primary and secondary teacher training to see if these techniques could be used in the tertiary sector. This paper is concerned with the technique known as Interaction Analysis.

So far research has shown that an important variable in teacher training is trainees receiving <u>immediate feedback on their performance during training</u>. In secondary and primary teacher training microteaching has systematized this feedback

process by allowing trainees to practise their teaching skills in a simulated classroom and use audio and video recordings of their performance to provide objective records for subsequent training sessions. Microteaching has also been supplemented with interaction analysis in order to give more direction and structure to the feedback process (McAleese, 1973). In applying microteaching to the training of university lecturers we have attempted to systematize the training process and to devise more effective protocols for training courses. Interaction analysis, or more correctly in this context, the systematic observation of lecturing, has suggested itself as both an evaluative and descriptive tool in training. Systematic observation means in this context the coding at regular intervals of the teaching behaviour of the lecturer and the recording of these events in a form that will facilitate feedback. The form of systematic observation used in Aberdeen has analysed the pedagogic structure of lectures and used this data in the training sessions to more accurately describe training performances and suggest ways of making the trainees performance more effective. Figure 1 summarises the categories that have been used to date.

----Figure 1 about here----

The Genesis of the System

In a study by Gage (Gage, 1968) he suggested that the ability to explain was a crucial factor in discriminating between effective and ineffective lecturers. This ability to explain can be described in terms of lecturers stating Rules

(Teaching Points) and relating these to Examples. This 'Rul-eg' unit was found more frequently in effective than in ineffective lecturers. It can therefore be assumed that the use of this unit just might be an important teaching skill that lecturers should learn in order to improve their effectiveness. It is from this premise that work began. In terms of discrete units that can be used for systematic observation, these 'Rul-eg' units can be broken down into Teaching Points (P) and Examples (E). Two other elements in the remaining content of lecturing were discovered in initial trials, Asides that are instructional in implication (Ai) and Asides that are non-instructional (Au). Adding these two categories to the 'Rul-eg' unit gave a description of the content of lecturing in instructional bits i.e. the pedagogic structure. By adding to these four categories a 'dust-bin', category X, an exhaustive description of lecturing can be obtained using these mutually exclusive categories. (See Figure 1). Before the analysis could be undertaken, a glossary for the categories and a set of ground rules were drawn up. The glossary clearly defined the inclusiveness of each of the categories and the ground rules were used to assist in making consistent decisions in application over doubtful encoding procedures. As the system was new some trials were undertaken to establish the reliability and validity for the categories.

Using a sample of 29 lectures these categories were applied using systematic observation. The encoding or recording procedure was to have a coder decide every three seconds which of the categories best fitted the verbal behaviour

(content) of the lecture during the previous time period. Table 1 shows the cumulative results of two trials of this analysis.

----Table 1 about here----

The concurrent validity of the categories were established using independent ratings of the samples as the dependent variable. Table 2 gives the correlation values for each category. Table 3 gives the stability of the categories.

----Tables 2 and 3 about here---

A test-retest reliability for four raters using the rating scale was established at 0.8.

In order to use the categories for further research and training the glossary and several ground rules were modified.

The System in Use

In order that the lecturers can use the system for the analysis of their lecturing they must first learn the procedure for analysis. Figure 2 summarises a two-day training programme that has been used.

----Figure 2 about here----

So that the lecturers can use the coding system with a high degree of reliability it is necessary to 'shape' their coding to ensure a high correlation between individual trainees and between codings of one trainee over a period of time on the same lecture. The training schedule is designed to do this.

An example of lecturing is selected that contains a good distribution of the categories. This one sample of teaching is used all the way through the initial training. Experience shows that using one piece of lecturing in the initial stages is most effective. Having both viewed and listened to the lecture and discussed the content in general terms, the trainees are introduced to the categories. Examples of these are given both verbally and on audio tape. It is important that the trainer should be flexible in this presentation of examples, although careful selection in advance makes for few disagreements. There will, however, be such disagreements as although the categories are relatively low in inference, there can be borderline cases. Using the difficult examples 'ground rules' can be developed with the trainees in order to facilitate coding. The purpose of this activity is to start 'shaping' of the lecturers in recognising the categories. Having listened to the lecture again and attempted to recognise the categories as they occur the trainees are next confronted with a transcript of the lecture. This is divided up into what is called 'thought units' (Taba, 1967) that is, remarks or a series of remarks that express a complete instructional unit. In practice these thought units are usually sentences (but not always). The trainees then code each of these units and record on the transcript their coding.

In stage two, the Time Line Display (TLD) is introduced. The TLD is a method of recording on paper a sequence of events showing both the category used and the passage of time. The

previously coded transcript is then transferred on the TLD. Stage three in the training is to introduce the idea of sampling of the verbal behaviour at regular time intervals. The time interval used in training is 6 seconds. At present we have used this slower interval as it was thought that the lecturers would be happier at this rate (most interaction work uses about 20 observations per minute or a 3 second time interval). It is envisaged that the rate will be increased to 3 second periods as lecturers become more familiar with the methodology. One of the reasons for this is to reduce the number of difficult coding decisions due to a change in category during the time period i.e. 6 seconds). The same piece of lecture is then Coded at 6 second intervals on the transcript. Some discussion takes place about the difference between thought units and 6 second segments. It is found in practice that there is very little difference in either the sequence of code symbols or the relative frequency of the observed categories. Having transferred the 6 second transcript to a TLD the trainees then can attempt their first 'live' coding. This is taken in easy stages, starting with 1 minute, then 2 minute segments and so on, working up to 10 minutes in about four steps. Again these codings are transferred to the TLD's. At the end of a morning spent discussing lecturing in terms of the categories and learning the categories the lecturers are usually ready to try the system on their own lecturing.

The Training Session

Having completed the initial training the lecturers go on to Day 2 of the programme. (See Figure 2). This uses conventional

microteaching practices of recording and playback of micro-lectures to provide an objective frame of reference for subsequent discussion.

---Figure 3 about here---

Figure 3 summarises in diagrammatic form the microteaching cycle that we have devised. During the playback of the microlecture the lecturers code their own and peers' teaching. These data are then used in the Critique session that follows in order to provide objective and reliable data on the subject's performance. The coding does not always cover the complete microlecture, as the trainers are always asked 'Is there any particular part of the lecture that you want to analyse in detail?' Either the first half, the middle, or the last half of the lecture is coded.

----- Figure 4 about here---

Figure 4 shows the TLD of a lecturer on one of the experimental sessions. These data are used by both the trainer and the trainees in their discussions. They provide the 'words' for describing the performance at any particular part of a microlecture. As yet there is no syntax of this 'language' as the norms that would be required to establish a syntax have not been established. Our research work is attempting to establish these values.

In order to evaluate this work several experimental sessions were run earlier this year in which systematic observation was used. Using the attitudes of the lecturers

as the dependent variable we were able to obtain subjective impressions of the efficacy of the technique. These results were very encouraging. They suggested that although we have not quite found the best use of these data in the training sessions, the information was very useful to the lecturers in describing their performance. The most important thing it did was to encourage the lecturers to talk about their teaching in a way that was neither glib nor superficial. The main defect of the system at present is that there is very often a situation where the trainee says ... 'OK, that part of the lecture did not go very well and I see from the TLD that during those two minutes I was using a lot of Ai's. What should I do about it? Should I not use 'useless' asides or What should I do ....?' At present we do not have the answer but on completion of a correlational study that is being undertaken we might be able to reply: '.. Yes, that's right, that part of the lecture did not go very well. We have found, however, that when we looked at effective and ineffective lecturers the former used a lot more (less!) Ai's than you did, now the next time you teach this aspect of the topic I suggest that you try and be more factual, use more P's and E's ... etc., etc.'

Perhaps this scenario is a little problematical; it does at least give the flavour of how interaction analysis might be used in a training session in the late 70's. We are sufficiently encouraged by our work at present to continue experimenting and to use systematic observation in both descriptive and evaluative roles in the training of university lecturers. It will be further used in other research studies into different aspects of lecturing.

Category	Frequency
P	60.7%
E	4.4%
Ai	17.0%
Au	4.2%
X	18.3%

N = 58

TABLE 1:
Relative Frequency of the Categories

Category	Product Moment Correlation
P	.51
E	.82
P + E	.54
Ai	.75
Au	n.a.
Ai + Au	.75

N = 18

12 point rating scale

(n.a. not enough data)

Table 2:

Concurrent Validity of the Categories

Category	Agreement
P	95%
E	57%
Ai	98%
Au	93%
X	97%

N = 29

Test - Retest
(10 day gap)

Table 3:
Stability of the Categories

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CONTENT ANALYSIS OF LECTURING (C.A.L.)

	Glossary	Coding Unit	Symbol
TEACHING	A teaching point, part of an argument or thesis. An item of information, an opinion, a fact, a generalization, a principle or concept. Lecturer's own opinion or quoting an other authority.	POINT	P
TEACHING	Examples, related to teaching points. Comparitors, a concrete example of a teaching point.	EXAMPLE	E
MANAGING	Verbal behaviour of relevance to the lecture but not intended as part of an argument or thesis. References, objectives or aims - relevant to the lecture or course of lectures. Summarizing teaching points made in other lectures.	ASIDE (Instructional)	Ai
MANAGING	A non-instructional aside. Comments of no direct relevance to topic of lecture. Greetings, tension releasers, directions, jokes or irrelevant examples.	ASIDE (Non-instructional /useless)	Au
	Verbal behaviour that is uncodable. Confusion or silence. Non-verbal communication. Writing on blackboard, using A-V aid; Student talk.		X

FIGURE 1 : The Content Analysis of Lecturing.

DAY 1	DAY 2
Training in Observation System	Training Session
1. View video tape of lecturer in lecture theatre.	1. Videotape Lecturers 1 to 4 - 9 minute microlectures
2. Discuss	2. Code first 5 minutes lectures, 1 and 2. (as a group)
3. The categories of the observation system	3. Code last 5 minutes lectures, 3 and 4 (as a group)
4. Listen to examples of categories	4. Replay lecture 1
5. Listen to lecture (same as 1), looking for examples of categories	5. Discuss, with codings
6. Discuss	6. Replay lecture 2
7. Code transcription of lectures (same as 1)	7. Discuss,with codings
8. The Time-line display (TLD)	8. Replay lecture 3
9. Transfer coding of lecture (7.) to TLD	9. Discuss, with codings
10. Sampling of teaching behaviour (3 seconds; 6 seconds)	10. Replay lecture 4
11. Code Typescript of lecture (same as 1) at 6 second intervals	11. Discuss, with codings
12. Transfer typescript (11.) to TLD	12. Evaluate the recordings and the codings
13. Sampling at 6 second intervals,(listen to timing)	
14. Listen to lecture (same as 1)	
15. Code lecture at 6 second intervals (same as 1.)	
16. Transfer lecture (15.) to TLD	
17. Discuss	

Figure 2: Training Programme

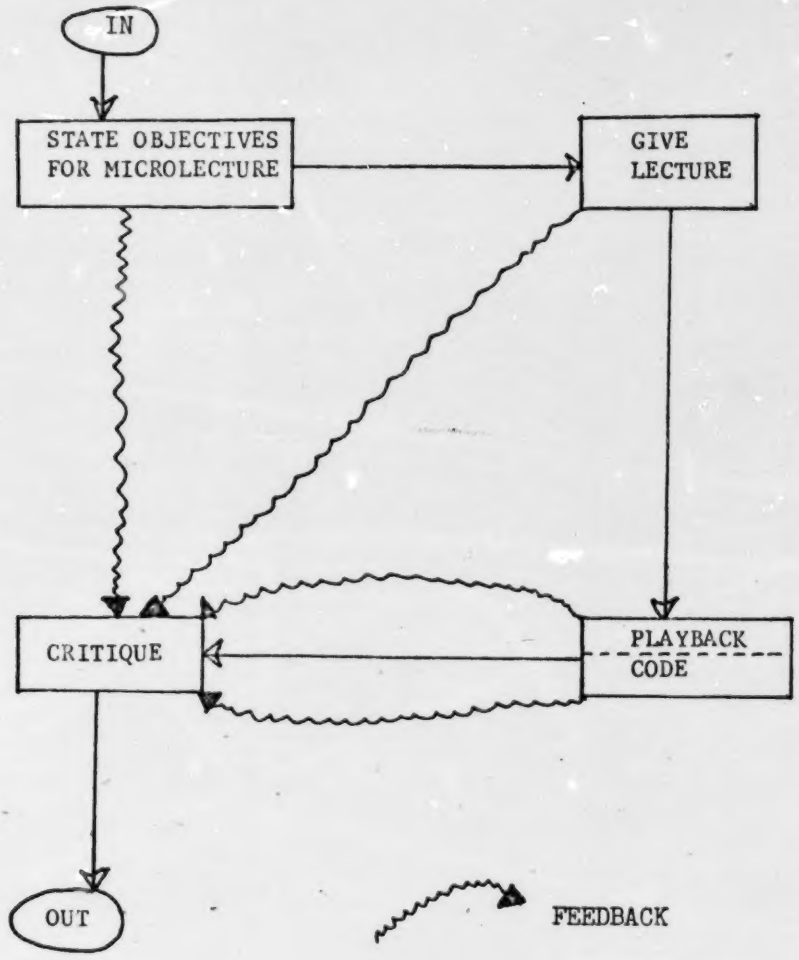

Figure 3:
Microteaching cycle for training

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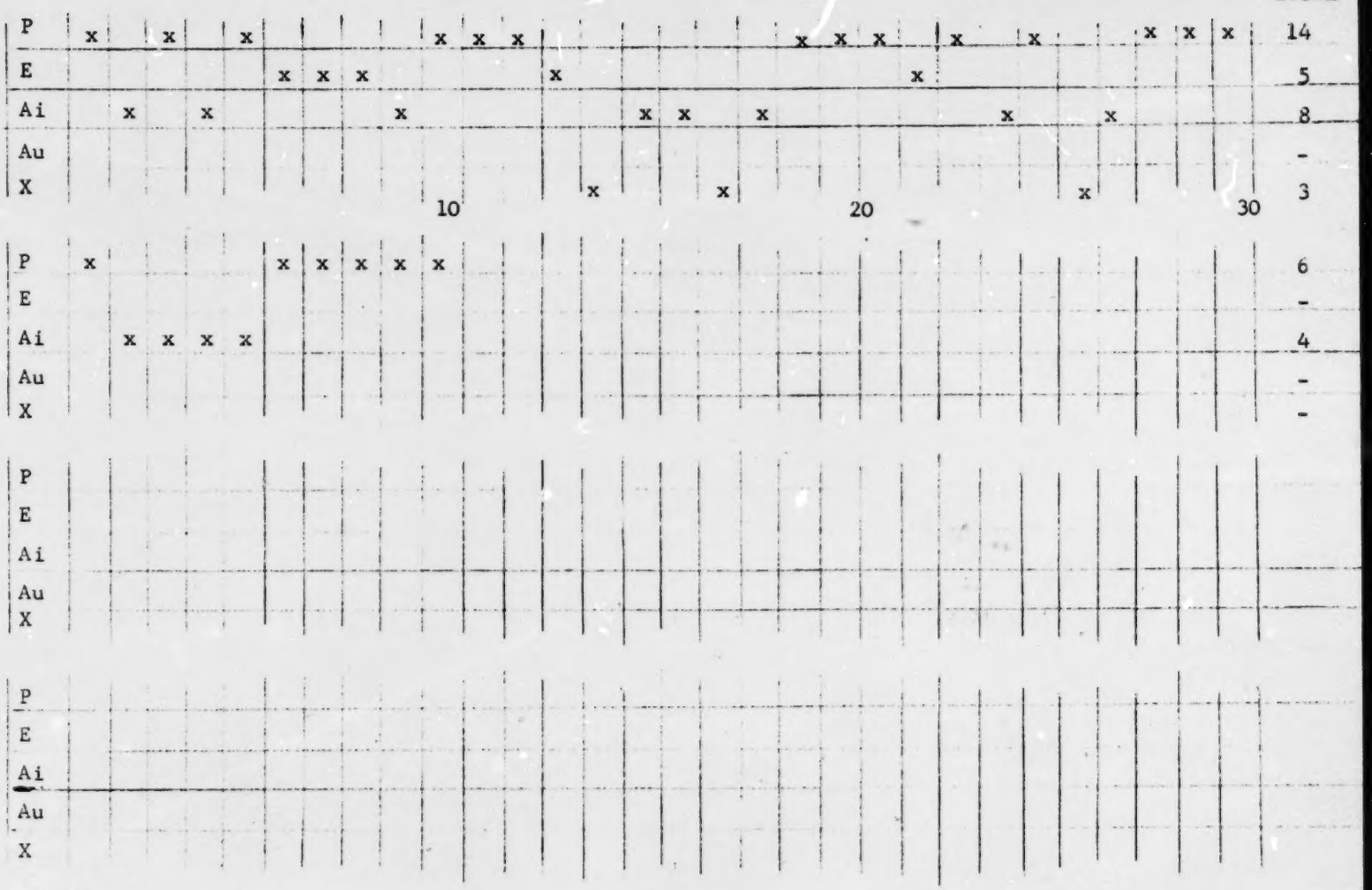
Page 1. of 1.

Coded at 6. sec.intervals



SUMMARY %

P	20
E	5
Ai	12
Au	-
X	3
Σ	40

Coder

R. McAleese

Lecturer

Mr. James

Date

25..4..73

Length

..... mins. .... secs.

NOTES:

Figure 4: A Time Line Display of a Lecture Profile

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